

## **REMARKS**

This amendment is filed in response to an office action mailed October 21, 2003, in which the Examiner (1) withdrew claims 4 and 6-14 from consideration in view of the applicant's election in response to a previous restriction requirement, (2) rejected claims 1-3, 5, 15-30, 60-63, and 67-70 under 35 U.S.C. §112 on various grounds, and (3) rejected claims 1-3, 15-18, 20-30, 60-63, and 67-70 under 35 U.S.C. §112 as obvious over U.S. Patent serial number 6,348,583 ("Segev") in light of U.S. Patent serial number 5,512,462 ("Cheng").

Each of these rejections will be addressed individually. In addition, claims 1, 60, 68, and 69 are amended to correct typographical errors. These amendments are not intended to alter the meaning or scope of the claims, but merely to improve their readability.

In subparagraph A of paragraph 5a, the Examiner rejected claims 1-3, 15-30, 60-63, and 67-70 as indefinite on the grounds that in claims 1, 60, and 67 "it is not clear whether if  $R_2$  is not a H or  $CH_3$ , does unsubstituted mean no functional group is attached or  $R_2$  is not present". The applicant respectfully submits that the claim clearly means that  $R_2$  is present. If  $R_2$  is not a H or  $CH_3$ ,  $R_2$  can be either (i) an unsubstituted alkyl or cycloalkyl with certain characteristics enumerated in each claim or (ii) a substituted alkyl or cycloalkyl with certain characteristics enumerated in each claim.

In subparagraph B of paragraph 5a, the Examiner rejected claims 1-3, 5-15, 60-63, and 67-70 as indefinite on the grounds that the use of the term "optionally" in claims 1, 60, and 67 rendered unclear whether limitations following such term were "optional"

or “critical”. The applicant has amended claims 1, 60, and 67 to clarify that the term “optionally was intended to have the meaning “can”.

In paragraph 5b, the Examiner rejected claims 1-3, 15-30, 60-63, and 67-70 on the grounds that they were not adequately described in the specification. The Examiner notes that the claims recite a variety of compounds and that the specification describes tetramethylene sulfoxide. The Examiner further notes that a representative number of examples must be disclosed and that common features or attributes should be disclosed. The specification does, however, disclose a representative number of examples and discuss features or attributes of the inventive compounds. For example, Tables 5 through 8 on pages 40 through 42 of the specification disclose data relating to propyl sulfoxide, methyl sec-butyl sulfoxide, and butyl sulfoxide, as well as tetramethylene sulfoxide. Moreover pages 10 through 12 of the specification discuss common features or attributes of the inventive sulfoxide compounds, e.g., factors affecting packing, which in turn may affect the potency of such compounds, according to the specification. Thus, the specification provides adequate written description of the claimed compounds.

In paragraph 6, the Examiner rejected claims 1-3, 15-18, 20-30, 60-63, and 67-70 as obvious over Segev in light of Cheng. Segev taught the use of certain compounds in connection with nucleotide mimetics. Cheng taught certain methods relating to PCR amplification; however, Cheng did not disclose the inventive compounds. According to the Examiner,

An ordinary practitioner would have been motivated to add the PCR components because Cheng taught that use of cosolvents influence the efficiency of amplification of the template by increasing the thermal stability of the DNA polymerase and reduces the loss of DNA polymerase

activity during repeated high-temperature denaturation steps (see column 9, lines 2-7). Therefore, an ordinary artisan would have been clearly motivated to have modified the compound taught by Segev with the addition of PCR components to achieve efficient and improved PCR system.

While Cheng does teach the use of cosolvents to influence amplification, among many other factors, Cheng does not mention the inventive compounds. On the contrary, he mentions other specific compounds, such as glycerol and DMSO. Nor does Cheng provide any factors by which compounds preferable to glycerol and DMSO can be identified. Indeed, Cheng does not even address the issue of whether solvents more efficacious than glycerol and DMSO might exist.

While Segev discloses certain general properties of PNA-DNA hybrids (col. 27, lines 5-35), Segev does not disclose any factors that would lead one to believe that use of the inventive compounds in the present application *in lieu of some other cosolvent* would increase the thermal stability of the DNA polymerase or reduce the loss of DNA polymerase activity during repeated high-temperature denaturation steps. It is impermissible hindsight to assume that one of ordinary skill in the art would have selected the inventive compounds of the present application to combine with Cheng even if Segev disclosed some of them. In the absence of a reference providing adequate motivation, an obviousness rejection is improper. “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” Manual of Patent Examining Procedure §2143.01 (citation omitted).

Thus, one of ordinary skill in the art would have no motivation to combine the teachings of Cheng with those of Segev. The applicant therefore believes that all of the outstanding claims of the present application are allowable over Segev in light of Cheng.

For the above reasons, the applicant believes that claims 1-3, 5, 15-30, 60-63, and 67-70 are allowable over the prior art of record and requests that a timely Notice of Allowance be issued.

Respectfully Submitted,

A handwritten signature in black ink, reading "Ethan Civan". The signature is written in a cursive style with a horizontal line underneath.

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